**REBUTTAL TESTIMONY OF**
**BURTON G. MALKIEL**
**ON BEHALF OF**
**SOUTH CAROLINA ELECTRIC AND GAS COMPANY**
**DOCKET NO. 2002-223-E**

**Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

A. My name is Burton G. Malkiel and my business address is Princeton University, Princeton, NJ 08544-1021.

**Q. HAVE YOU PREVIOUSLY FILED TESTIMONY IN THIS PROCEEDING?**

A. Yes.

**Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?**

A. My rebuttal testimony addresses issues raised by Michael Gorman (on behalf of the South Carolina Energy Users Committee ("SCEUC")) in his direct testimony, including his criticism of my reliance upon the discounted cash flow ("DCF") model for estimating the cost of equity capital for South Carolina Electric and Gas Company ("SCE&G"), and by David C. Parcell (on behalf of the South Carolina Consumer Advocate ("CA") and South Carolina Merchants Association ("SCMA")) in his direct testimony, including his criticism of my reliance upon securities analysts' projected growth rates in my DCF analysis and my

recommendation that the estimate of SCE&G's cost of equity capital be adjusted to include flotation costs.

**Q. ON PAGE 20, LINES 6-17 OF MR. GORMAN'S PREFILED TESTIMONY, HE CRITICIZES YOUR DCF ANALYSIS AS "LIMITED IN SCOPE, NOT SUPPORTED BY OTHER ANALYSES, AND THEREFORE SUBJECT TO SIGNIFICANT ERRORS AND DISTORTION." DO YOU AGREE?**

A. No, I do not agree. Mr. Gorman challenges my failure to include in my prefiled testimony an analysis using the capital asset pricing model ("CAPM"). The reason I did not include a CAPM analysis is simple: For the reasons discussed below, current financial thought and research demonstrates that the CAPM is not a reliable analytical tool to estimate SCE&G's cost of equity capital.

The capital asset pricing model is not reliable to estimate the market-required rate of return for companies comparable to SCE&G for three primary reasons:

1) Betas from period to period tend to be unstable,

2) Beta estimates can vary based on the time period chosen and the market index against which beta is measured, and

3) Betas have not shown a consistent relationship with actual returns. Indeed, the measured relationship between beta and return has been flat over long periods of time.

1) Betas are Unstable

It has long been realized that measured betas from one period are unreliable estimates of betas in the next period.[1] Companies can change their product mix or pricing policies, and a myriad of special events can change the relationship of a company's returns with those of the market. This is also the case for public utilities, where new competitive environments can alter the characteristic risk aspects of the companies' securities.

2) Betas Cannot be Measured Accurately

It is very difficult, if not impossible, to measure beta with any degree of precision. Richard Roll has argued that it is virtually impossible to find a true measure of all the assets that comprise the "market portfolio."[2] Depending on how one measures the "market," it is possible to come up with very different measures of beta. For example, one can get different beta estimates by changing the market proxy from the S&P 500 Index to the Wilshire 5000 Index.

3) The Measured Relationship Between Equity Returns and Beta Has Been Flat

According to the capital asset pricing model, there is a positive relationship between beta and return as shown by the following equation.

$$R_i = R_F + b\,(R_M - R_F),$$

[1] See, for example, Marshall E. Blume, "On the Assessment of Risk," *Journal of Finance*, March 1971 and Peter L. Bernstein, *Against the Gods*, Wiley, 1996.

[2] See Richard Roll, "A Critique of Asset Pricing Theory's Tests," *Journal of Financial Economics*, March 1977.

where $R_i$, $R_F$, and $R_M$ stand for the return from the i'th security, the risk-free rate, and the market return respectively. The higher the beta of a security, the higher is its required rate of return. According to the theory, low beta stocks should have low returns.

In a study covering a period from the early 1960s into the 1990s, Eugene Fama and Kenneth French have found that the actual relationship between beta and return has been flat.[3] Fama and French divided all traded stocks on the New York, American, and NASDAQ exchanges into deciles according to their beta measures over the 1963-90 period. Decile one contained the 10 percent of all stocks that had the lowest betas; decile ten contained the 10 percent that had the highest betas. The remarkable result, shown in the following Table 10[4] is that there was essentially no relationship between the return of these decile portfolios and their beta measures. I have done a similar study showing no relationship between return and beta for mutual funds. From my study, it appears that there is no relationship between returns for stocks or portfolios and their beta measures of risk, confirming the Fama-French results.

[3] Eugene F. Fama and Kenneth R. French, "The Cross-section of Expected Stock Returns," *Journal of Finance*, June 1992.

[4] Table 10 is the first table in my rebuttal testimony, but is numbered sequentially from the last table in my prefiled direct testimony.

The Fama-French comprehensive study covered a period of almost 30 years, leading Fama and French to conclude that the relationship between beta and return is essentially flat. In sum, the Fama-French study and my own study show quite conclusively that beta, the key analytical tool of the capital asset pricing model, is not a useful measure to capture the relationship between risk and return.

In conclusion, for these three reasons, I rejected the capital asset pricing model because it is not a reliable and useful analytical tool for estimating SCE&G's cost of equity capital. For these same reasons, I therefore reject the estimates of SCE&G's cost of equity capital made by other witnesses in this case using the capital asset pricing model. In each analysis performed using CAPM, I believe the results are unreliable and grossly understate the required rate of return for SCE&G.

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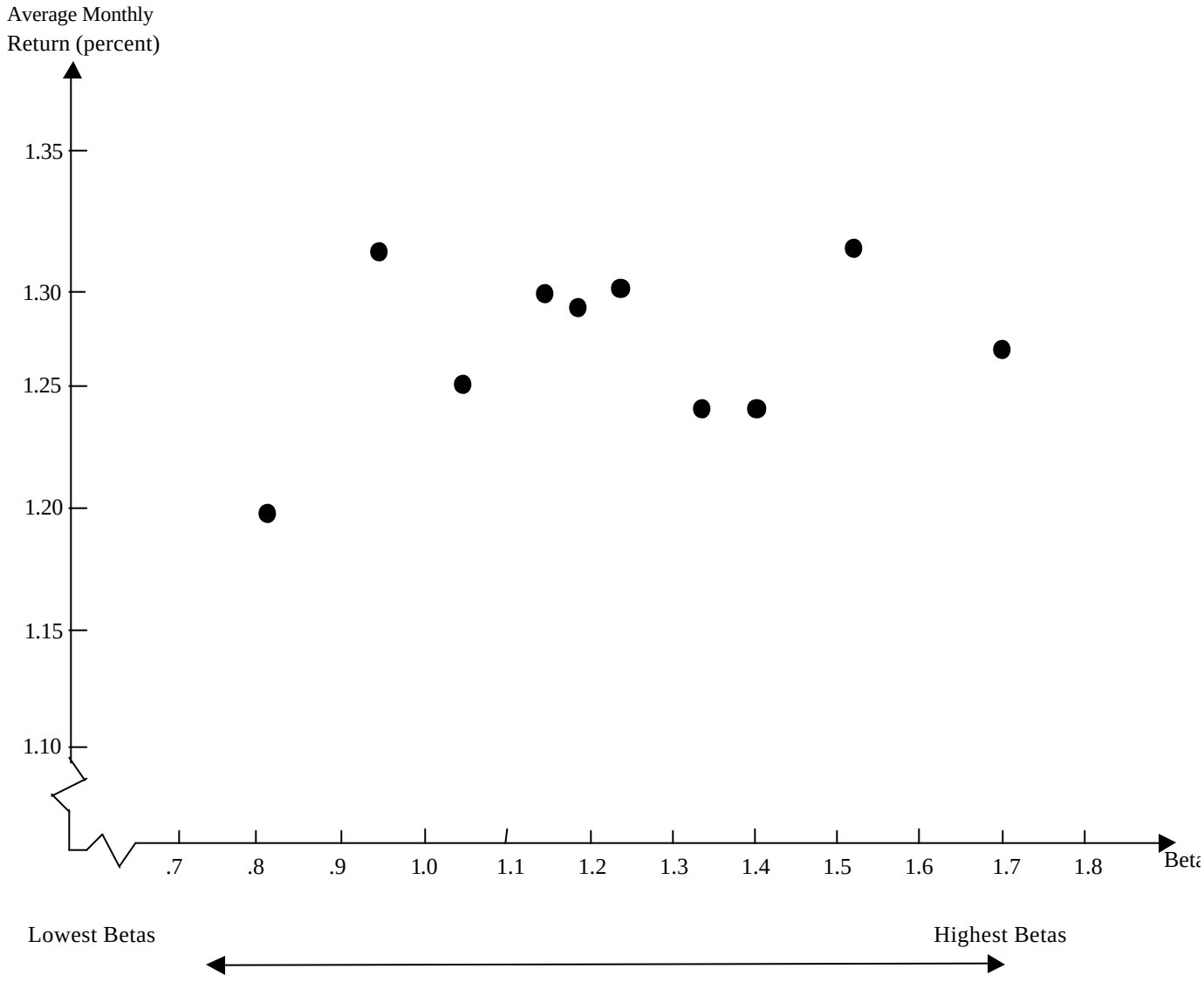
## Table 10

AVERAGE MONTHLY RETURN VS. BETA: 1963-1990




Source: Fama and French, "The Cross-Section of Expected Stock Returns," *Journal of Finance*, June 1992.

**Q. DID YOU ALSO CONSIDER THE RISK PREMIUM METHOD FOR ESTIMATING THE REQUIRED RATE OF RETURN ON EQUITY FOR SCE&G?**

A. Yes, but I also rejected the use of a "risk premium" method of estimating the required rate of return on equity for SCE&G for the following reasons.

In principle, it is not unreasonable to project rates of return from the market by looking at realized rates of return during very long periods of past history. Over a period of approximately 75 years, large company stocks have produced a geometric mean return of 10.7 percent and an arithmetic mean return of 12.7 percent. The average of the two figures would produce an estimate of 11.7 percent. Taking the same kind of average for long-term government returns, the Ibbotson number is 4.9 percent. Thus, large company stocks have produced a rate of return approximately 6.8 percentage points greater than the return from long-term government bonds.

If we apply the same risk premium today, with a long-term (30 year) government bond yield of 5.2 percent, we would arrive at an estimated required rate of return for the market of approximately 12 percent. Many analysts would then adjust that return upward or downward depending on the capital asset pricing model beta for the stock in question. As I have indicated previously, however, I do not believe that the capital asset pricing model is a useful one for estimating

required rates of return. Therefore, were I to use the risk premium method, I would produce an estimated required cost of capital of 12 percent (before flotation costs) which is roughly consistent with the estimates I have produced via the Gordon Model. I should note also that in the Ibbotson data the stocks of smaller companies have generally produced rates of return that have been considerably higher (more than 1½ percentage points) than the 12 percent figure noted above. SCE&G would qualify as a small company, and, therefore, one would expect its required rate or return (cost of equity capital) to be higher than estimates produced by the standard "risk premium" method. Consequently, while I rejected the use of the "risk premium" method for estimating SCE&G's required rate of return, my analysis leads me to conclude that the required equity rates of return produced by the standard risk premium method is largely consistent with my DCF analysis.

**Q. ON PAGE 21, LINES 6-9 OF HIS PREFILED TESTIMONY, MR. GORMAN STATES THAT "[I]T IS UNREASONABLE AND ILLOGICAL TO BELIEVE THAT THE GROWTH RATE" OF THE PEER COMPANIES "COULD EXCEED THE GROWTH RATE OF THE ECONOMY." IS MR. GORMAN CORRECT IN HIS OBSERVATION?**

A. No, he is not correct. Witness Gorman objects to my use of growth rates that exceed the growth rate of the national economy. It is important, however, to understand that there is a difference between the growth rate of earnings per share

for all companies in the economy and the growth rate of total earnings. I agree with Mr. Gorman that total corporate earnings should not grow at rates greater than the growth rate of the economy. Any other assumption would imply that the profit share of the national income would increase over time continuously — an unreasonable assumption. But the following illustration shows that earnings available for the shareholder can grow at a greater rate than the rate of growth of gross profits.

Consider a case where gross profits grow at a 5 percent rate but that the typical company is leveraged so that some of the gross profit goes to pay bond interest. Suppose, for example, we have the following two period example:

**Table 11**

| | **Base Period** | **Next Period** | **Percent Increase** |
|---|---|---|---|
| | | | |
| Gross Profits (EBIT) | 100 | 105 | +5% |
| Interest | 50 | 50 | |
| Taxes (33 ½%) | 16.65 | 18.32 | |
| | | | |
| Profits After Tax Available for the Shareholder | 33.35 | 36.68 | +10% |

Note that while gross profits in this example increase by 5 percent, profits available for the common shareholder increase by 10 percent.

It is also the case that many corporations use some of their profits to buy back common shares, thus tending to shrink the number of shares outstanding,

*ceteris paribus*. In such a case, earnings per share will tend to grow at a rate faster than the rate of growth of earnings available for the common shareholder. Thus, for both reasons I believe it is entirely reasonable to project growth rates of earnings per share at rates greater than that for the national economy. Moreover, as Mr. Gorman notes (Gorman p. 8, ll. 10-14), it is the expected growth rates of security analysts that are the most relevant in explaining actual market valuations and required rates of return.

**Q. MR. GORMAN CHALLENGES TWO OF THE COMPANIES INCLUDED IN MR. OSBORNE'S PEER GROUP. MR. GORMAN ELIMINATES THESE TWO COMPANIES AND RECALCULATES YOUR ESTIMATE OF THE EQUITY COST OF CAPITAL IN TABLE 3 ON PAGE 21 OF HIS PREFILED TESTIMONY. PLEASE EXPLAIN THE EFFECT OF MR. GORMAN'S RECALCULATED DCF RESULTS ON YOUR WORK.**

A. There is very little change (about ten (10) basis points) in the cost of equity capital estimates by excluding the two companies that Mr. Gorman challenges as not being comparable enough to SCE&G for inclusion in the Peer Group. Mr. Gorman agrees that the other five companies in Mr. Osborne's Peer Group are in fact comparable. While I do not agree with his exclusion of DPL Inc. and Great Plains Energy, I note that excluding these two companies has minimal impact upon my analysis results. My DCF analysis (before flotation costs) is 12.35 per

cent (rounded to 12.3 per cent), while Mr. Gorman's DCF analysis (prior to his challenge to projected growth rates) is 12.25 per cent. This difference of five (5) basis points is not material, but I based my work on Mr. Osborne's Peer Group. I continue to believe that his group provides a reasonable and fair proxy for determining the required rate of return for SCE&G.

**Q. ON PAGE 22, LINES 7-9, MR. GORMAN CRITICIZES YOUR DCF ANALYSIS OF A SAMPLE OF MUCH LARGER GAS AND ELECTRIC UTILITIES ON TWO GROUNDS, I.E., LACK OF RISK COMPARABILITY AND EXCESSIVE PROJECTED GROWTH RATES. PLEASE RESPOND TO THESE CRITICISMS.**

A. First, it should be recalled that I specifically stated in my analysis of a sample of larger electric and gas companies that these companies were perceived by the market to be less risky than SCE&G. Thus, I did not present this sample of larger companies as risk comparable to SCE&G, but as less risky, and, therefore, an analysis of their cost of equity capital provided an excellent check upon the reasonableness of my estimates of the required rate of return for SCE&G.

Second, as shown in Table 11 above, it is perfectly reasonable for companies to enjoy growth rates of earnings per share larger than the nominal growth rate for the economy in general. Further, as Mr. Gorman admitted, the projected growth rates of securities analysts are the most "accurate predictors of

future returns." (Gorman p. 8, ll. 10-11). This admission is important because it confirms my own experience and research and validates my DCF analysis.

Moreover, as stated above, my choice of a sample of much larger electric and gas utilities was designed to confirm the reasonableness of my DCF analysis. Experience and research teaches that the market perceives these much larger companies to be less risky, not more risky, than the much smaller SCE&G. Consequently, one would expect the required return for the sample of larger companies to be less than the required return for SCE&G. My analysis for the larger companies reflected a cost of equity capital of approximately 11.8 per cent, which established an absolute minimum for the cost of equity capital for large gas and electric utilities. Moreover, the market will impose some additional cost on smaller utilities to compensate investors for the perceived greater risk attached to a company such as SCE&G. I conservatively estimated this factor to be 20 basis points, although a review of Ibbotson historical data reveals that the spread between larger companies and smaller companies over time is in excess of 1½ percentage points. Moreover, the aforementioned Fama-French study found a strong effect of company size on realized rates of return.

In summary, my DCF analysis for the sample of larger companies is, I believe, accurate, although quite conservative. Therefore, the analysis of the sample of larger companies supports and validates my estimate of SCE&G's cost

of equity capital ranging from 12.2 to 12.8 per cent, with a midpoint of 12.5 per cent (including flotation cost).

**Q. MR. GORMAN CHALLENGES YOUR RECOMMENDATION THAT THE COMMISSION CONSIDER FLOTATION COST IN DETERMINING THE REQUIRED RATE OF RETURN. HE ARGUES THAT FLOTATION COSTS ARE NOT KNOWN AND MEASURABLE AND SHOULD BE REJECTED. PLEASE RESPOND TO THIS ARGUMENT.**

A. SCE&G reports to me that SCANA's most recent offering of securities for SCE&G's benefit closed on October 16, 2002, resulting in 6,000,000 shares being sold at $25.10/share, raising $150,600,000. The shares were discounted from the market price of $25.32/share by $.22/share. Underwriting fees were 3.25 percentage points and other cost (legal, accounting, printing, etc) were approximately $220,000. Total flotation costs were approximately $6,434,200 or 4.24 percentage points.

SCE&G reports to me that these costs have been fully incurred and are clearly known and measurable.

In my prefiled direct testimony, I estimated the cost associated with this issuance of new securities to be 4¼ percent, based upon projections made by SCE&G. It now is clear that my use of 4¼ percent based upon SCE&G's estimates was approximately correct.

These costs have been fully incurred, are real costs of assessing capital markets, and should be included in any fair analysis to determine SCE&G's cost of equity capital. My analysis includes flotation cost, as does Commission Staff witness Spearman, and it is my recommendation that SCE&G be permitted to recover these legitimate and real costs of raising equity capital for the benefit of its operations and customers.

**Q. WITNESS PARCELL ON PAGE 27, LINES 12-23 EXPLAINS THAT HE USED A COMBINATION OF "FIVE INDICATORS OF GROWTH IN [HIS] DCF ANALYSIS." THEN, ON PAGE 40-43, WITNESS PARCELL CRITICIZES YOUR RELIANCE UPON SECURITIES ANALYSTS' PROJECTED GROWTH RATES IN YOUR DCF ANALYSIS TO THE EXCLUSION OF MR. PARCELL'S SELECTION OF GROWTH INDICATORS. PLEASE RESPOND TO WITNESS PARCELL'S SELECTION OF GROWTH INDICATORS AND HIS CRITICISM OF YOUR USE OF SECURITIES ANALYSTS' PROJECTED GROWTH RATES IN YOUR DCF ANALYSIS.**

A. In my book with John Cragg entitled, *Expectations of the Structure of Share Prices*[5], Dr. Cragg and I studied analysts' forecasts over very long periods of time. One of the main findings of the study published in this book was that the

most effective predictor of future growth was securities analysts' forecasts. Constructed growth rates based either upon historical growth or retention rates and historical rates of return on equity are unreliable and are not nearly as effective predictors of future growth as analysts' forecasts. Consequently, Mr. Parcell's DCF analysis significantly underestimates SCE&G's true cost of equity capital because he utilized constructed growth rates using historical data and retention rates, when the proven choice, and the most direct and most effective predictor of future growth is analysts' forecasts.

Also, please note that Witness Gorman agrees with the finance community's use of analysts' forecasts. On lines 10-11, page 8 of his testimony, Gorman notes that "[s]ecurity analysts' growth estimates have been shown to be more accurate predictors of future returns than growth rates derived from historical data."

Witness Parcell also criticizes my use of securities analysts' forecasts in performing my DCF analysis, arguing that analysts' forecasts include an upward bias rendering them suspect as a reliable predictor of future growth rates. This question has been a matter of particular interest and study for me and, as stated earlier, was a focus of the Cragg-Malkiel book. Another main finding of the book was that analysts' forecasts are not always overly optimistic. In some periods they

[5] John Cragg and Burton G. Malkiel, *Expectations and the Structure of Share Prices*, (University of Chicago Press, 1982.)

are indeed overly optimistic. In other periods they are, however, not optimistic enough.

In the 1990's, I agree that there was over-optimism in securities analysts' forecasts. This was especially true in the late 1990's during a period that I describe as the biggest bubble of all times in the soon to be published eighth edition of my book, *A Random Walk Down Wall Street*. It is also true that analysts' projections were tainted by their firms' investment banking connections. To support his argument, Witness Parcell includes a quote from a speech delivered on March 26, 2002 by Federal Reserve Chairman Alan Greenspan. In relevant part Mr. Greenspan states as follows:

> "I suspect that with the underlying database publicly available, it is just a matter of time before the ex post results of analysts' recommendations are compiled and published on a regular basis. I venture to say that with such transparency, the current upward bias of analysts' earnings projections would diminish rather rapidly, because investment firms are well aware that security analysis without credibility has no market value."

I agree with Mr. Greenspan when he states that the upward bias of analysts' earnings projections would diminish rather rapidly once their work is transparent to the public. With all the publicity given to tainted analysts' forecasts in investigations instituted by the New York Attorney General, the National Association of Securities Dealers, and the Securities & Exchange Commission, I believe the upward bias, that existed in the late 1990's has indeed diminished. In

summary, I believe that current analysts' forecasts are more reliable than they were during the late 1990's. Therefore, analysts' forecasts remain the proper tool to use in performing a Gordon Model DCF analysis.

**Q. ON PAGES 33-37 OF HIS PREFILED DIRECT TESTIMONY, WITNESS PARCELL SETS FORTH THE RESULTS OF HIS COMPARABLE EARNINGS ANALYSIS. DO YOU AGREE WITH HIS ANALYSIS AND CONCLUSIONS?**

A. No. First I would note that all statistics based on book values are suspect. Book values depend on depreciation policies, policies with respect to write-offs, etc., and are generally not comparable among companies. Second, Mr. Parcell admits that his recommended rate of return for SCE&G would lead to a fall in the price to book value ratio, i.e., the stockholders would be made worse off. If companies are to be allowed rates of return that enable them to raise new capital, then those rates cannot be ones that cause their stock prices to decline.

**Q. IN YOUR OPINION WOULD THE COST OF EQUITY CAPITAL ESTIMATES PROPOSED BY CA AND SCMA WITNESS PARCELL AND SCEUC WITNESS GORMAN PROVIDE SCE&G WITH FAIR AND REASONABLE RETURNS ON ITS PLANT AND FACILITIES DEVOTED TO PUBLIC USE? PLEASE EXPLAIN.**

A. No, their estimates do not provide fair required return rates to SCE&G.

As all witnesses in this case have noted, the goals in estimating required rates of return are two-fold:

(1) First, a utility should be allowed the opportunity to realize earnings at a sufficient level so that it is able to attract capital at reasonable cost, and

(2) Second, a utility should be allowed the opportunity to realize earnings at a level comparable to firms facing comparable risk.

In summary, my own work as well as the work of Fama-French and Myron Gordon confirm that the growth rates projected by securities analysts are the most reliable tool for estimating the cost of equity capital using a DCF analysis. Further, my own work and Dr. Gordon's work have demonstrated that a DCF analysis using analysts' projected growth rates is the most direct, most widely used and accepted, and most reliable model in use in corporate finance today to estimate a company's cost of equity capital. Consequently, the DCF analysis and results set forth in my prefiled direct testimony provide the most reliable estimate of SCE&G's cost of equity capital and should be used to the exclusion of competing analysis developed using the capital asset pricing model.

Further, as I've explained earlier in this testimony, the results of risk premium analyses, when performed according to standard finance theory, do not vary materially from my DCF analysis. Nevertheless, the Gordon Model DCF analysis is the most appropriate and most reliable model to estimate SCE&G's

required return rates on common equity, and I highly recommend its use and results in this case.

If a lower return rate were authorized, it would in my opinion jeopardize SCE&G's ability to attract capital at reasonable rates in the current volatile securities market and unreasonably and unlawfully require it to devote private assets to public use at return levels lower than those returns expected for companies facing equivalent risk. In the long run the company, its customers and the state would be harmed by a decision that failed to permit an investor owned public utility from fully recovering its cost of equity capital.

**Q. WITNESS PARCELL RECOMMENDS THAT THE CAPITAL STRUCTURE OF SCE&G INCLUDE SCE&G'S COSTS OF SHORT TERM DEBT. SEE PAGES 20-21 OF PARCELL'S PREFILED DIRECT TESTIMONY. DO YOU AGREE?**

A. In my judgment in estimating a company's cost of capital, it is preferable to consider only its permanent capital structure, that is, common equity, preferred stock, and long-term debt. It is a tenet of corporate finance that permanent investments such as plant and facilities should be financed with relatively long-term and permanent securities. Short-term debt is subject to constant fluctuation in amount and changing interest rates, depending upon such factors as the volume of the firms accounts receivable. Further, the amount of short-term debt can be

influenced by the impending maturity of long-term debt instruments. Therefore, I reject witness Parcell's recommendation that short-term debt and its current lower cost be included in SCE&G's capital structure for purposes of calculating its overall rate of return. Just as Mr. Parcell would not want to include short-term debt if the current short-term interest rates were, say, in excess of eight (8) percent, it is unreasonable to include short-term debt in SCE&G's capital structure now when short-term interest rates are relatively low. To include short-term debt will tend to distort the company's true cost of financing its business operations since capital projects are financed through either equity or long-term debt.

**Q. ON PAGES 44-45 OF HIS PREFILED DIRECT TESTIMONY, WITNESS PARCELL DISAGREES WITH YOUR PROPOSED ADJUSTMENT FOR FLOTATION COST. PLEASE RESPOND TO HIS ARGUMENTS AND HIS RECOMMENDATION THAT THERE IS NO NEED FOR A FLOTATION COST ADJUSTMENT.**

A. Witness Parcell apparently misunderstands my recommendation for adjusting flotation costs. In my direct testimony, I recognize that only about 3/8ths of SCE&G's future capital needs will be raised through external sources. The remaining 5/8ths of its cash requirements over the next three (3) years is forecasted to come from business operations or raised by external debt financing.

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Standard finance theory acknowledges that the costs associated with raising external capital should be allowed as a cost of the capital raised. When I performed my flotation cost analysis, I did not make any adjustments for capital that would be raised internally through retention of earnings. I applied the proposed adjustment only to the Company's forecast that about 3/8ths of its cash needs in the next three years will be provided by an offering of new securities.

I am informed that the Commission has a general policy of considering a flotation cost adjustment if a public issuance of securities has occurred in the recent past or is expected to occur in the near term. In this case an offering just occurred and it would be entirely appropriate to provide a flotation cost adjustment to recognize the real cost associated with this issue.

**Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

A. Yes.